

REMARKS

Claims 3-20 are pending in the current application, claims 1-2 having been canceled and claims 12-20 having been added by the current amendment. Applicants thank the Examiner for indicating that claims 4 and 5 would be allowable if claim 4 was rewritten in independent form. Claims 3 and 6-11 stand rejected and Applicants respectfully request reconsideration and allowance of claims 3-20 in view of the following remarks.

The specification has been amended to make minor editorial changes. Claims 1 and 2 have been canceled. Claims 3 and 4 have been rewritten in independent form including all the original limitations of the base claim. Also, in claims 3 and 4 "sequentially formed on a substrate" has been changed to "sequentially located on a substrate." Claim 4 has been amended to reflect two minor editorial changes. Thus, claims 4 and 5 should now be allowable and the Examiner is respectfully requested to make such indication. Additionally, claims 6, 7, and 11 have been amended to depend from claims 3, 12 and 3, respectively.

Claims 3 and 6-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kelley et al.* (U.S. Patent No. 6,534,572) in view of *Dimitrakopoulos et al.* (U.S. Patent No. 5,981,970). This rejection is respectfully traversed.

Claim 3 recites an organic thin film transistor, comprising a gate electrode, a gate insulating film, an organic active layer and a source/drain electrode, or a gate electrode, a gate insulating film, a source/drain electrode and an organic active layer, sequentially formed on a substrate, wherein the gate insulating film is a multi-layered insulator comprising a first layer of a high k material and a second layer of

an insulating organic polymer compatible with the organic active layer, the second layer being positioned directly under the organic active layer, wherein the high k material for the first insulating layer is a mixture of an insulating organic polymer and an organic metal compound, or a mixture of an insulating organic polymer and nanoparticles of an inorganic metal oxide or a ferroelectric insulator, wherein the high k material has a dielectric constant (k) of 5 or higher.

Claims 6-11 depend from claim 3.

To establish a case of *prima facie* obviousness under 35 U.S.C. § 103, a reference or group of references must 1) disclose or suggest motivation to modify the reference or combine reference teachings, 2) provide a reasonable expectation of success, and 3) disclose or suggest each and every element of the claimed invention.

With regard to claim 3, the Examiner relies on *Kelley et al.* for allegedly teaching a gate insulating material having a high k material of dielectric constant of 5 or higher. The Examiner further relies on *Dimitrakopoulos et al.* to provide that the high k material for the first insulating layer is:

- (1) a mixture of an insulating organic polymer and an organic metal compound, or
- (2) a mixture of an insulating organic polymer and nanoparticles of an inorganic metal oxide or a ferroelectric insulator.

However, neither *Kelley et al.* nor *Dimitrakopoulos et al.* teach or suggest an organic metal compound for use in a first insulating layer. *Dimitrakopoulos et al.* discloses depositing a BST layer (an inorganic material) from a sol gel solution of Ba, Sr, and Ti organometallic precursors (Column 7, lines 48-50), but this is quite different from

incorporating an organic metal compound into the first insulating layer. Also, neither *Kelley et al.* nor *Dimitrakopoulos et al.* teach or suggest nanoparticles of an inorganic metal oxide or a ferroelectric insulator for use in a first insulating layer. *Dimitrakopoulos et al.* discloses inorganic metal oxides and ferroelectric insulators. It does not teach or suggest the use of nanoparticles.

Furthermore, the Examiner relies on *Dimitrakopoulos et al.* to allegedly teach a mixture of an insulating layer of organic polymer and either an organic metal compound or nanoparticles of an inorganic metal oxide or a ferroelectric insulator. However, *Dimitrakopoulos et al.* does not teach that the gate insulating film can be a mixture of two components.

Moreover, embodiments of a organic thin film transistor covered by claim 3, for instance, exhibit the attendant advantage of a charge mobility of $3 \text{ cm}^2/(\text{V}\cdot\text{sec})$ or greater. Neither *Kelley et al.* nor *Dimitrakopoulos et al.* teach or suggest such an organic think film transistor with a charge mobility of $3 \text{ cm}^2/(\text{V}\cdot\text{sec})$ or greater.

Therefore, since *Kelley et al.* does not disclose all the elements of the claims at issue and since *Dimitrakopoulos et al.* does not remedy the deficiencies of *Kelley et al.*, a case of *prima facie* obviousness has not been established in regard to claims 3 and 6-11.

Accordingly, the applicants respectfully request that the rejection of claims 3 and 6-11 under §103(a) unpatentable over *Kelley et al.* in view of *Dimitrakopoulos et al.* be withdrawn.

Claims 12-20 have been added by the present amendment. No new matter has been added. Claim 12 depends from claim 3 and support can be found on page 6, lines 15-24 of the application. The subject matter of claims 13-20, which depend

from claim 4, is based on versions of the original dependant claims in the application now depending from claim 4. Support for claims 13-20 can be found throughout the application. Claims 12-20 depend from claims 3 or 4 and are thus allowable, and such indication is respectfully requested.

With regard to the Examiner's statement that the process limitations recited in claims 2 (now in claims 12 and 13) and 7 (now also in claim 15) ("the first and the second layers of the gate insulating film are formed by a wet process" and "the wet process is carried out by a spin coating, a dip coating, a printing, or a roll coating method") do not carry any patentable weight, applicants have otherwise demonstrated the respective claims' patentability but reserve the right to prove that products produced by the respective processes are patentably distinct.

In view of the foregoing, further and favorable consideration of the subject application in the form of a Notice of Allowance is respectfully requested.

If there are any questions concerning this response, or the application in general, the Examiner is respectfully requested to telephone applicant's undersigned representative so that prosecution may be expedited.

Respectfully submitted,

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